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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,242	09/15/2003	Gururaj M. Katti	Intel-005PUS	2391

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EXAMINER	
WILSER, MICHAEL P	
ART UNIT	PAPER NUMBER
2109	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/662,242	KATTI ET AL.	
	Examiner	Art Unit	
	Michael Wilser	2109	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/29/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to the original filing of September 15, 2003. Claims 1-25 are pending and have been considered below.

Drawings

1. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because some of the figures and all of the reference characters and figure numbers are hand drawn or hand written which makes details of the figures hard to see. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 80 in Figure 2, 120 in Figure 6, 122 in Figure 6, 184 in Figure 9, and 186 in Figure 9. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of

an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to because Figures 10A, 10B, 11A, 11B, 12A, and 12B do not include any reference characters. The drawings require reference characters for any particular part of the drawing that is discussed in the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: the examiner notes the use of acronyms (e.g. MAC, ATM, etc.) throughout the specification without first including a description in plain text, as required.

5. On page 20 line 16 the applicant lists Figure 6 as having a write latency, read latency, and usage latency but does not provide any reference characters for these three items. Since they each appear in the figures and the specification they should have reference characters associated with each item to assist in clarification.

6. Beginning on page 27 of the specification and ending on page 29 the applicant discusses Figures 10A, 10B, 11A, 11B, 12A, and 12B. The specification discusses particular parts of these figures but does not provide any reference characters for the different parts being discussed. Reference characters should be added so that one of ordinary skill in the art can easily go from the specification to the figures and know exactly what the applicant is trying to explain or show.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-11, 13, and 16-25 are rejected under 35 U.S.C. 103(a) as being obvious over Dice (US 7,178,062) in view of Wilkinson, III et al. (US 6,934,951).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Claims 1, 16, 20, and 23: Dice comprises a method, a computer readable medium, a processor, and a memory system (column 10, lines 3-18 & column 9, lines 36-55) to control critical sections of code comprising:

a. configuring processors with multiple threads to execute a critical section of code (column 2, lines 6-19); and

b. processors operable to execute the critical section in turns (column 6, lines 32-44).

However, Dice does not explicitly disclose that the controlling threads of execution of the processors avoid occurrence of idle time between execution of the critical sections. However, Wilkinson discloses a similar method, medium, processor, and system that do minimize idle time between the execution of critical sections (column 3, lines 46-55). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have minimized the idle time in Dice between execution of critical sections. One would have been motivated to minimize the idle time between critical section since it has long been a goal to minimize system idle time and maximize throughput within the computing arts.

Claims 2 and 17: Dice and Wilkinson disclose a method and medium as in Claims 1 and 16 above, and Wilkinson further discloses enabling the threads to execute in order via inter-thread signaling (column 6, lines 13-27). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have the threads in Dice to use inter-thread signaling. One would have been motivated to use inter-thread signaling since there are multiple threads trying to execute and therefore the threads would be able to signal one another when the next is ready to execute.

Claims 3, 18, 21, and 24: Dice and Wilkinson disclose a method, medium, processor, and system as in Claims 2, 17, 20, and 23 above, and Wilkinson further discloses that a

first instruction causes an inter-thread signal to a next thread to be generated (column 6, lines 6-24) and a second instruction to wait for an inter-thread signal from a previous thread (column 6, lines 28-43). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have theses instructions be the instructions in Dice. One would have been motivated to have these instructions so that the inter-thread signaling has a set of parameters, which controls how the signaling is to be processed when a thread is signaled.

Claim 4: Dice and Wilkinson disclose a method as in Claim 3 above, and Wilkinson further discloses that latency often occurs within control section execution and that to minimize this latency the thread should only be able to repeat its request for a certain period of time (column 2, lines 52-67 & column 3, lines 1-2). However, Wilkinson does not explicitly disclose that the latency comprises at least three instruction cycles. However, Official Notice is taken that it is old and well known within the computing arts to have latency before allowing an operation to continue. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have a write latency of at lease three instruction cycles in Dice. One would have been motivated to have this write latency so that it provides amble time for a thread in the critical section to finish its operation, this way the data needed for the critical section operation is not over written before the thread has finished executing.

Claim 5: Dice and Wilkinson disclose a method as in Claim 3 above, and Wilkinson further discloses that the processor has a register in which the inter-thread signal is given to the thread (column 6, lines 13-27). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have a register process the inter-thread signal in Dice. One would have been motivated to use a register for the inter-thread signal since the register would allow a place to store the instruction until the thread was ready to receive the instruction.

Claim 6: Dice and Wilkinson disclose a method as in Claim 5 above, and Wilkinson further discloses registers which can handle inter-thread and inter-process signaling (column 6, lines 13-27). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have the registers in Dice be inter-thread and inter-processor signaling registers. On would have been motivated to have these registers since registers are designed to store and transfer data from on source to another and the signaling from threads and processors is just another group of data which can be stored and moved.

Claim 7: Dice and Wilkinson disclose a method as in Claim 6 above, and Wilkinson further discloses that the processors use external registers (column 4, lines 8-18). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use external registers as the register in ice. One would have been

motivated to use external registers so that the registers immediately available to the processor are left open for more critical operations.

Claims 8, 9, 19, 22, and 25: Dice and Wilkinson disclose a method, media, processor, and system as in Claims 8, 1, 16, 20, and 23 above, and Dice further discloses that the processors relinquish control of a program comprising the critical section as soon as the critical section has been executed (column 20, lines 20-24).

Claim 10: Dice and Wilkinson disclose a method as in Claim 1 above, and Wilkinson further discloses that processors can operate at least two critical sections of code (column 5, lines 29-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to operate two critical code sections in the processors of Dice. One would have been motivated to operate two critical sections since the system is a multiple processor system and therefore each processor can execute at least one critical section of code.

Claim 11: Dice and Wilkinson disclose a method as in Claim 10 above, and Wilkinson further discloses that the processors comprise a functional pipeline (column 1, lines 10-26). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have the processors in Dice comprise a functional pipeline. One would have been motivated to have the processors form a functional pipeline since

each processor is capable of carrying out various tasks and functions and therefore knows where to send the data to next in the order of execution.

Claim 13: Dice and Wilkinson disclose a method as in Claim 1 above, and Wilkinson further discloses that the processors form a functional pipeline (column 1, lines 10-26) and one or more of the critical sections are executed in the pipeline (column 5, lines 29-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have one of the critical sections in Dice executed in a functional pipeline. One would have been motivated to execute the critical section in the pipeline since the critical section needs certain resources to complete and this way it can get the resources while still allowing other threads and processes to move through.

9. Claims 12, and 14-15 are rejected under 35 U.S.C. 103(a) as being obvious over Dice (US 7,178,062) and Wilkinson, III et al. (US 6,934,951) as applied to claims 1-11, 13, and 16-25 above, and further in view of Meng (US 2004/0246956).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed

in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Claim 12: Dice and Wilkinson disclose a method as in Claim 11 above, but do not explicitly disclose that critical section of code comprises a metering microblock and that another critical section comprises a congestion avoidance microblock. However, Meng discloses a similar method in which the critical section of code does contain microblocks (page 1, paragraph 14 and page 2, paragraph 19). Additionally it is known that microblocks are a set of function calls that can be setup to perform different desired tasks within the computing arts. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have microblocks for metering and congestion avoidance in Dice and Wilkinson. One would have been motivated to have these microblocks since the critical section of code requires the system to be metered or watched and that congestion has to be monitored to keep the throughput of the processors maximized.

Claim 14: Dice and Wilkinson disclose a method as in Claim 13 above, but do not explicitly disclose that the critical section of code comprises an asynchronous transfer mode receive processing microblock. However, Meng discloses a similar method that does comprise asynchronous transfer mode and microblocks (page 1, paragraph 10 & 14). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have an asynchronous transfer mode microblock in Dice and Wilkinson. One would have been motivated to have an asynchronous transfer mode microblock since this is a common communication method in the computing arts which produces function calls that would need to be received and handled by the appropriate microblock.

Claim 15: Dice and Wilkinson disclose a method as in Claim 13 above, but do not explicitly disclose of critical sections containing microblocks comprised of a set of function calls. However, Meng discloses a similar method in which the microblocks are comprised of sets of function calls (page 1, paragraph 14 & page 2 paragraph 19). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have a traffic management microblock be a microblock in the critical section of Dice and Wilkinson. One would have been motivated to have a traffic control microblock to control the amount and type of information being received through asynchronous transfer mode during the critical section of code.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hua et al. (US 6,845,504) Method and System for Managing Lock Contention in a Computer System.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Wilser whose telephone number is (571) 270-1689. The examiner can normally be reached on Mon-Fri 7:30-5:00 EST (Alt Fridays Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Myhre can be reached on (571) 270-1065. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MPW
March 7, 2007

James Myhre
Supervisory Patent Examiner